

**What is claimed is**

- 1) Apparatus for reading from or writing to optical recording media, comprising:
  - 5       a tracking device,
  - a four-quadrant detector,
  - two summation points,
  - a phase comparator for tracking in accordance with the differential phase detection method, and
  - 10       variable delay elements that can be set by a control device, wherein
  - at least one of said variable delay elements is a digital variable delay element and at least one of said variable delay elements is an analog
  - 15       variable delay element, wherein
  - at least one of said variable delay elements is arranged between one of said summation points for output signals of detector elements of the four-quadrant detector and said phase comparator, and
  - 20       at least one of said variable delay elements is arranged between said four-quadrant detector and one of said summation points, wherein no digital variable delay element is arranged between said four-quadrant detector and one of said summation
  - 25       points.
- 2) Apparatus according to claim 1, characterized in that respective digital delay elements of the variable delay elements are assigned to the
- 30       summation points, and in that a switching device is present for the purpose of connecting one of the digital delay elements to an output of an offset determining device.
- 35   3) Apparatus according Claim 1, characterized in that a switching device is present for the purpose of inserting a digital delay element of the variable

delay elements between one of the summation points and the phase comparator.

- 4) Apparatus according to claim 1, characterized in  
5 that a switching device is present for connecting two of the variable detector elements of the four-quadrant detector to respective analog delay elements.
- 10 5) Apparatus according to claim 1, characterized in that an interference signal generating device is present, whose output is connected to the tracking device and to a first input of the control device,  
15 whose second input is connected to the output of the phase comparator.
- 6) Apparatus according to Claim 5, characterized in  
20 that the control device has a comparison device, at whose inputs the output signal of the phase comparator and the output signal of the interference signal generating device are present and whose output signal serves for setting at least one analog delay element of the variable delay elements.
- 25 7) Apparatus according to claim 1, characterized in that a control output of the control device, at which an output signal is present, is assigned a circuit block, which determines at least one of  
30 absolute value and sign of the signal present at the control output.
- 8) Apparatus according to claim 1, characterized in  
35 that a converter is connected between a digital delay element of the variable delay elements and one of the summation points.

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- 9) Apparatus according to claim 1, characterized in that the control device and at least some of the variable delay elements are realized on an integrated circuit.
- 10) Apparatus according to Claim 1, characterized in that the control device has an offset determining device, at whose input the output signal of the phase comparator is present and whose output signal serves for setting at least one digital delay element of the variable delay elements.
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- 11) Apparatus according to claim 10, characterized in that digital delay elements of the variable delay elements are respectively assigned to the summation points, and in that a switching device is present for the purpose of connecting one of the digital delay elements to the output of the offset determining device.
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- 12) Apparatus according Claim 10, characterized in that a switching device is present for the purpose of inserting a digital delay element of the variable delay elements between one of the summation points and the phase comparator.
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- 13) Apparatus according to claim 10, characterized in that a switching device is present for connecting two of the detector elements of the four-quadrant detector to respective analog delay elements of the variable delay elements.
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- 14) Apparatus according to claim 10, characterized in that an interference signal generating device is present, whose output is connected to the tracking device and to a first input of the control device, whose second input is connected to the output of the phase comparator.
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- 15) Apparatus according to Claim 14, characterized in  
that the control device has a comparison device, at  
whose inputs the output signal of the phase  
5 comparator and the output signal of the  
interference signal generating device are present  
and whose output signal serves for setting at least  
one analog delay element element of the variable  
delay elements.
- 10 16) Apparatus according to claim 10, characterized in  
that a control output of the control device, at  
which an output signal is present, is assigned a  
circuit block, which determines at least one of  
15 absolute value and sign of the signal present at  
the control output.
- 17) Apparatus according to claim 10, characterized in  
that a converter is connected between the digital  
20 delay element and one of the summation points.
- 18) Apparatus according to claim 10, characterized in  
that the control device and at least some of the  
delay elements are realized on an integrated  
25 circuit.